Fall 2021

BIOL 352-001: Genetics

Mary Konsolaki

NJIT BIOLOGY

Course Syllabus

FALL 2021

BIOLOGY 352 GENETICS
FACE-to-FACE CLASS

INSTRUCTORS:	Dr. Mary Konsolaki	**EMAIL:**	mary.konsolaki@njit.edu
OFFICE:	CKB 340D 973-642-4975	**OFFICE HOURS:**	Thu 2:30-4:00pm (F2F) or by appointment (virtual)
COURSE SCHEDULE:	KUPF 205 Tue-Thu 11:30am -12:50pm	**COURSE WEBSITE:**	https://njit.instructure.com/courses/18332

ATTENDANCE
Attendance is mandatory for this class and will be monitored through short in-class quizzes online. Attendance of 85% of lectures earns full attendance credit for the course. You will need to have a computer or a cell phone in order to complete these quizzes online. If you expect to miss a class for a valid reason, please email Dr. Konsolaki and provide documentation (mary.konsolaki@njit.edu)

COURSE DESCRIPTION: This course surveys the basic concepts of Genetics. We plan to start the course with a detailed examination of classical genetics experiments beginning with those of Mendel, followed by a study of DNA structure and manipulation. Further lectures in the course will focus on some of the details of molecular genetics, developmental genetics, and population genetics.

PREREQUISITES:
Foundations of Biology: Cell and Molecular Bio, BIOL201 and BIOL202 with grade C or better.

OBJECTIVES: To provide the student with: (1) knowledge of terms, concepts and theories of Genetics (2) the ability to integrate the material from multiple sources and research (3) improved critical thinking skills and the opportunity to apply genetic concepts in everyday biology-related applications

INSTRUCTIONAL MATERIALS: Genetics Essentials, Fourth Edition (2018) Benjamin A. Pierce. Students can purchase a 6-month subscription to the E-book, ISBN: 9781319189051 (most affordable option). Below is the link for the different options:
https://store.macmillanlearning.com/us/product/Genetics-Essentials/p/1319107222?searchText=genetics%26%23x20%3bessentials

Some additional reading may be occasionally assigned from online resources (free text) such as PubMed eBook http://www.ncbi.nlm.nih.gov/books/NBK21766/?term=Genetics

SUPPLEMENTAL MATERIALS: Any additional materials required for class would either be provided through Canvas (UCID required), or via web link.

CODE OF STUDENT CONDUCT: Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found

at: http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu

REASONABLE ACCOMMODATION: If you have a special need that may require an accommodation or assistance, please inform us of that fact as soon as possible and no later than the end of the second class meeting. Students with disabilities who require accommodations must contact Dr. Phyllis Bolling, Center for Counseling and Psychological Services (C-CAPS), Campbell Hall, (entry level), room 205, (973) 596-3420

COURSE EVALUATION PROCEDURES:

GRADING	POINTS
Exam 1	20% (100pts)
Exam 2	20% (100pts)
Exam 3 (Final)	25% (125pts)
Review Quizzes (3)	10% (50pts)
Project	10% (50pts)
Homework	10% (50pts)
Attendance & Participation	5% (25pts)
TOTAL	**100% (500pts)**

GRADING SCALE	
A	90-100
B+	85-89
B	80-84
C+	75-79
C	65-74
D	50-64
F	0-49

Extra Credit: There will be no individualized opportunities for extra credit. There may be opportunities for the entire class during the course.

The topics to be covered will include:

- Introduction to Molecular Genetics
- DNA Structure and Manipulation
- Mendelian Genetics
- Sex-chromosomes and Sex-linkage
- Genetic Linkage and Chromosome Mapping
- DNA Replication and Recombination
- Molecular Organization of Chromosomes
- Human Karyotypes and Chromosome Behavior
- Microbial Genetics
- Gene Expression
- Regulation of Gene Expression
- Genomics, Proteomics and Transgenics
- Genetic Control of Development
- Mutations and DNA Repair
- Genetics of Cell Cycle and Cancer
- Mitochondrial DNA and Extranuclear Inheritance
- Population Genetics
- Quantitative Genetics

Late work: Work submitted late will be penalized with a 10% per day reduction.

COURSE SCHEDULE

Schedule: Dates listed by week; lectures will meet twice every week, unless otherwise noted. Homework assignments will be due on Saturday midnight, on Canvas and review quiz assignments will be due on Sunday midnight. Please note that this is the proposed schedule and is subject to change. A more detailed schedule will be continually updated via the course Canvas site.

Week of	Lecture Topic	Assignments Due
9/2	Introduction to Genetics	No HW
9/6	Chromosomes / Basic principles of heredity	HW1 (Canvas)
9/13	Sex-linked traits/ Extensions & modifications of Mendelian Genetics	HW2 (Canvas)
9/20	Human Genetics /Pedigree analysis / Genetic testing	Review Quiz 1 on Canvas
9/27	Linkage & recombination / Exam 1	HW3 (Canvas)
10/4	Mapping of human genes / Bacterial and Viral genetics *Project released*	HW4 (Canvas)
10/11	Chemical nature of a gene / Chromosome structure / DNA replication	HW5 (Canvas)
10/18	Central Dogma / Transcription	HW6 / *Project Assignment 1* (Canvas)
10/25	Translation / Genetic code	Review Quiz 2 on Canvas
11/1	Exam 2 / Bacterial gene regulation	HW7 (Canvas)
11/8	Eukaryotic gene regulation / Regulatory RNA	HW8 (Canvas)
11/15	Mutations / Transposable elements	HW9 / *Project Assignment 2* (Canvas)
11/22	Genetic techniques / Thu No Class (Thanksgiving)	HW10 (Canvas)
11/29	Epigenetics / Cancer genetics	Review Quiz 3 on Canvas
12/6	Model organism genetics / The-omics era	*Project Assignment 3* (Canvas)
12/13	Exam 3 (Final)	Final Exam Schedule will be posted here: http://www5.njit.edu/registrar/exams/